nova230 for LON

User's Manual

7000975003 Q6

This manual describes the current EPROM status, Version K and Version 1.12 of the LON230 parameterisation program.

nova230 for LON

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Trademarks

Designer	Trademark of Micrografx, Inc.
Micrografx Designer	Trademark of Micrografx, Inc.
Media Manager	Trademark of Micrografx, Inc.
Windows	Trademark of Microsoft Corporation
Microsoft Office 97 Professional	Trademark of Microsoft Corporation
MS Office	Trademark of Microsoft Corporation
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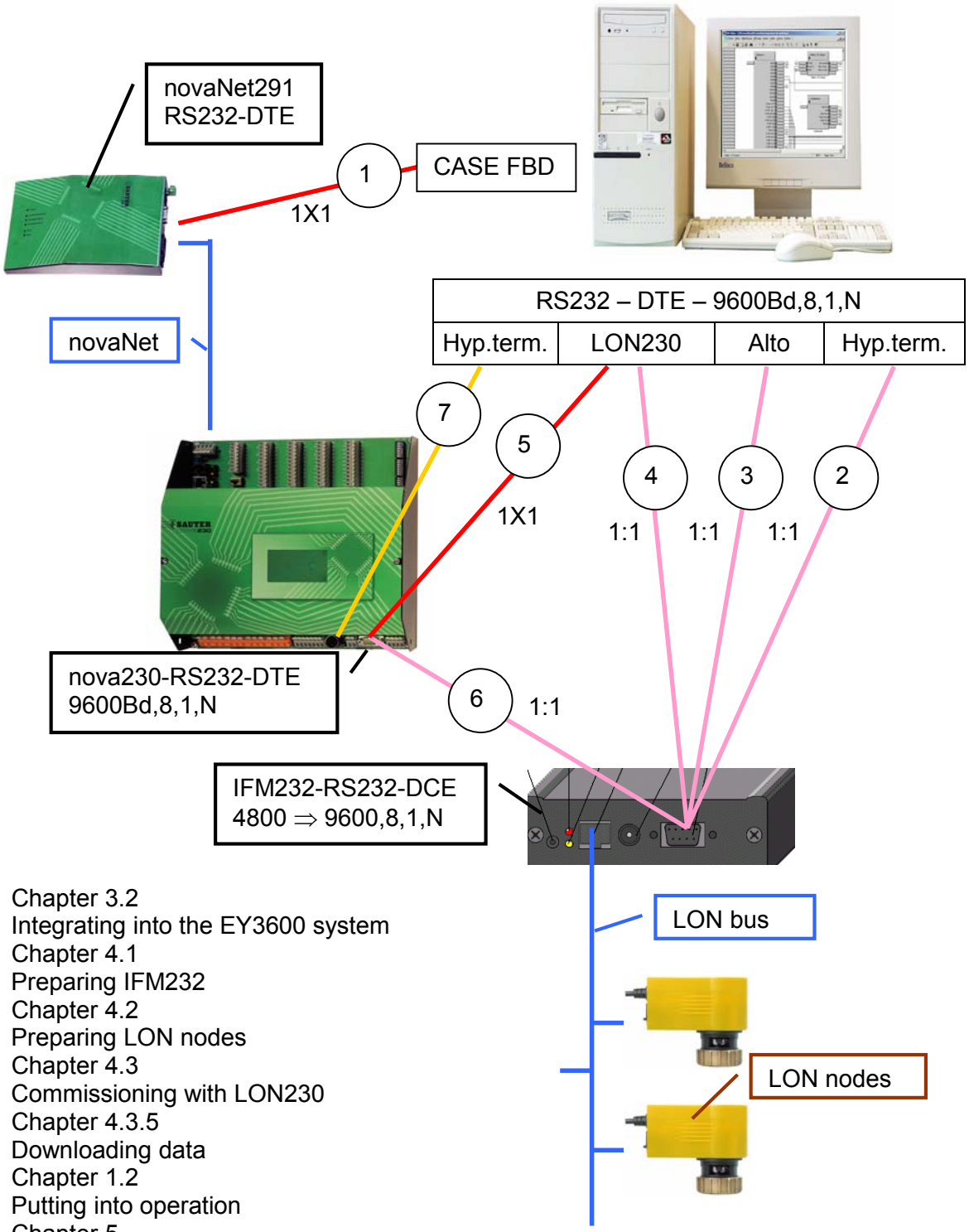
1 Introduction

1.1 Description of the system

The EYL230 F110 automation station is a high-grade automation station with similar performance features to the nova210. In addition, it has an interface which can be used to connect LON components to the Sauter management system via a LON gateway.

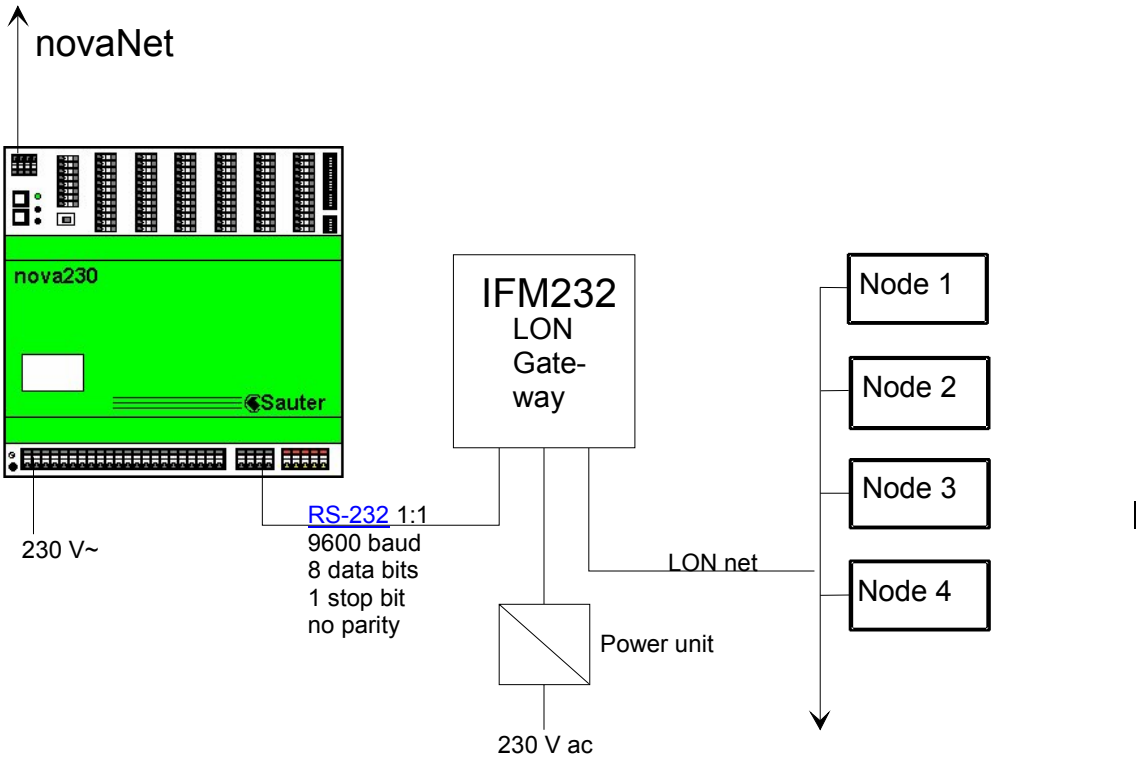
The automation station can read and send data from and to the LON components.
The desired data can also be called up from the LON network by means of prioritised polling.
Commands to the LON bus are privileged and are transmitted spontaneously.
It is currently possible to process most of the simple SNVT types and enumeration types, with the exception of structures, character strings and combined SNVT structures (manufacturer-specific data points, non-standard NVs).
A list of all the data points that can be connected is given in the Annexe.
The generation of the transfer list is handled by a generation and commissioning tool. This program (designated LON230.EXE) is a 32-bit Windows program which makes it possible to perform various commissioning functions, such as LON network scanning, value interrogation, value writing, generation of the transfer list and downloading the transfer list into the AS.
This software is connected in full to the LON IFM-RS232 interface via the serial interface of the PC. This eliminates the need for a special plug-in PC card.
Administrative tasks on the LON bus (assigning addresses to the LON nodes, etc.) can be carried out with the help of the ALTO software (from Sysmik GmbH, free download from WWW).
A possible communication fault between the AS and the LON interface is signalled for the management level on the MFA 255.
For commissioning purposes, it is possible to log the communication between the AS and the LON interface (PC with terminal software).

1.2 Putting into operation



1. Chapter 3.2
   Integrating into the EY3600 system
2. Chapter 4.1
   Preparing IFM232
3. Chapter 4.2
   Preparing LON nodes
4. Chapter 4.3
   Commissioning with LON230
5. Chapter 4.3.5
   Downloading data
6. Chapter 1.2
   Putting into operation
7. Chapter 5
   Monitoring mode

1.3 Structure of the system in operation



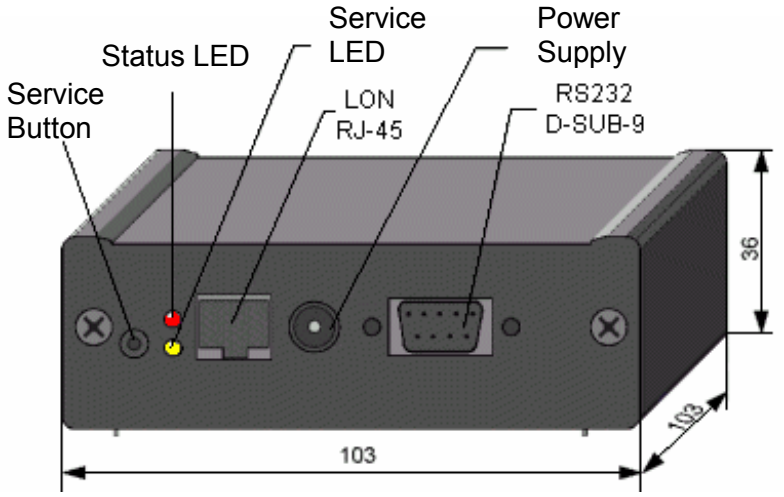
1.4 Description of the hardware

1.4.1 Connecting the components in operation

The following connections must be made between the AS, the LON interface and the LON bus:-

- Connection between the RS-232 serial interface of the nova230 (9-pin sub-D plug) and the RS232 interface of the LON interface (IFM-RS232) with a serial 9-pin extension cable, fully assigned.
  Communication should be configured for 9600 Bd, 8 data bits, 1 stop bit, no parity, no handshake.
- Voltage supply for the LON interface via a plug-in power unit or similar, with a voltage of 10...30 V d.c., 200 mA.
- Connection from the LON bus to the RJ45 socket on the LON interface (see also the documentation on the IFM-RS232 interface from Sysmik).
  Polarity is irrelevant for the LON bus.
- Supply of 230 V a.c. for the nova230, plus connection of the novaNet etc.
- (If applicable) connection for a logging facility via terminal 126 of the nova230 to the COM interface of a PC (2-core).

1.4.2 LON interface, IFM-RS232



Description of the individual components of the LON interface:-

Service button:	Is used to configure the interface. To configure, keep this button pressed in when you switch the interface on. Then you are taken to a service menu.
Status LED: (yellow)	This LED informs you about the operational status of the interface.
Service LED: (red)	This LED informs you about the operation of the LON interface.
LON RJ-45:	Connection for the LON bus and the voltage supply.
Power supply:	via 12 V d.c. power supply unit.
RS232:	Interface (as per the RS232 standard) to the nova230 or PC. Default configuration: 4800 Bd.

A clip is used to fix the interface to the underside of the device, on a 35 mm rail (switch cabinet).

LED:-

- No LED lights up: No power or device defective
- LED yellow on: IFM232 incorrectly configured
- LED red flashes: Modem initialisation
- LED red on: Normal, short interruptions, when data is being exchanged

For details of the configuration and operation of the interface, please refer to the documentation on the IFM-RS232M from *Sysmik*.

2 Stoftware installation Alto and LON230

Operating system requirements:-

Windows95 with Office 97
Windows98 with Office 97
Windows2000 with Office 97/Office 2000

2.1 Alto installation

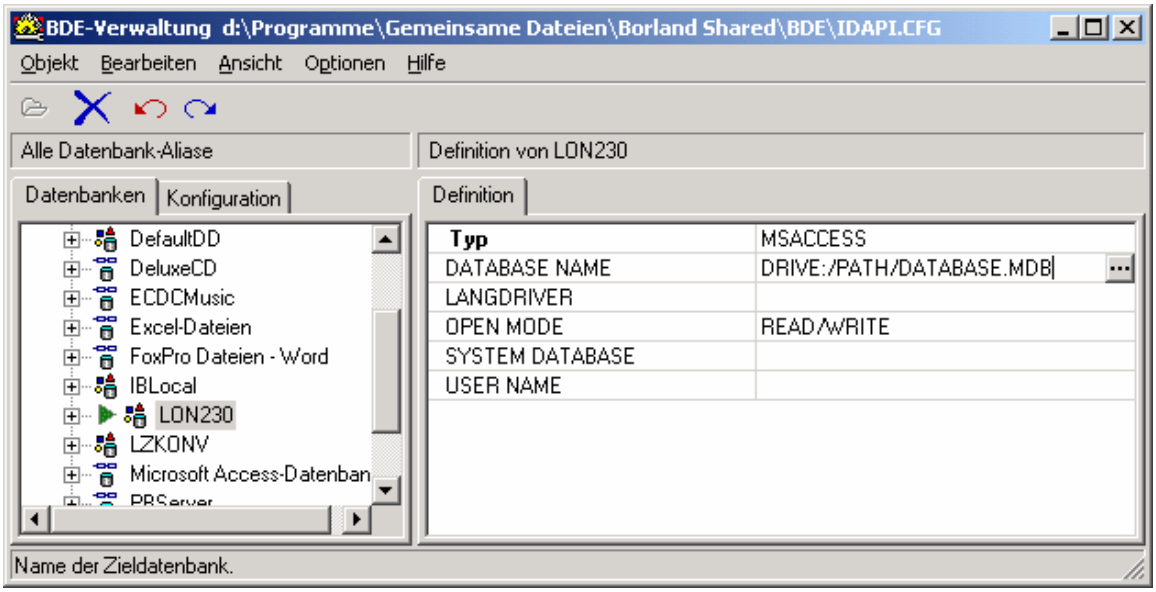
Run SETUP.EXE in the following folder:-
EY3600nova\Paraprogramme\Eyl230_Fxxx\F110_Lon\Alto auf der EY3600 CASE FBD / novaPro32 CD-ROM.
A basic installation of Alto.EXE is executed in the folder C:\programs\ALTO16.

2.2 LON230 installation

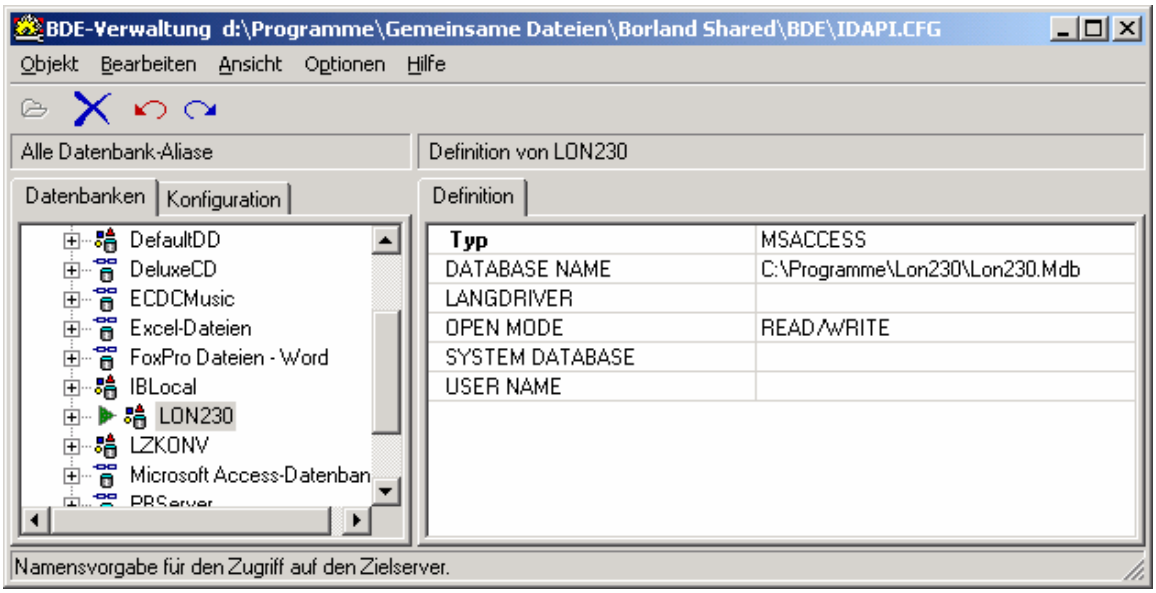
Run SETUP.EXE in the following folder:-
EY3600nova\Paraprogramme\Eyl230_Fxxx\F110_Lon\Install\Install auf der EY3600 CASE FBD / novaPro32 CD-ROM.
When you do this, a basic installation of LON230.EXE is performed in directory C:\Programs\Lon230.

2.3 Configuring the database

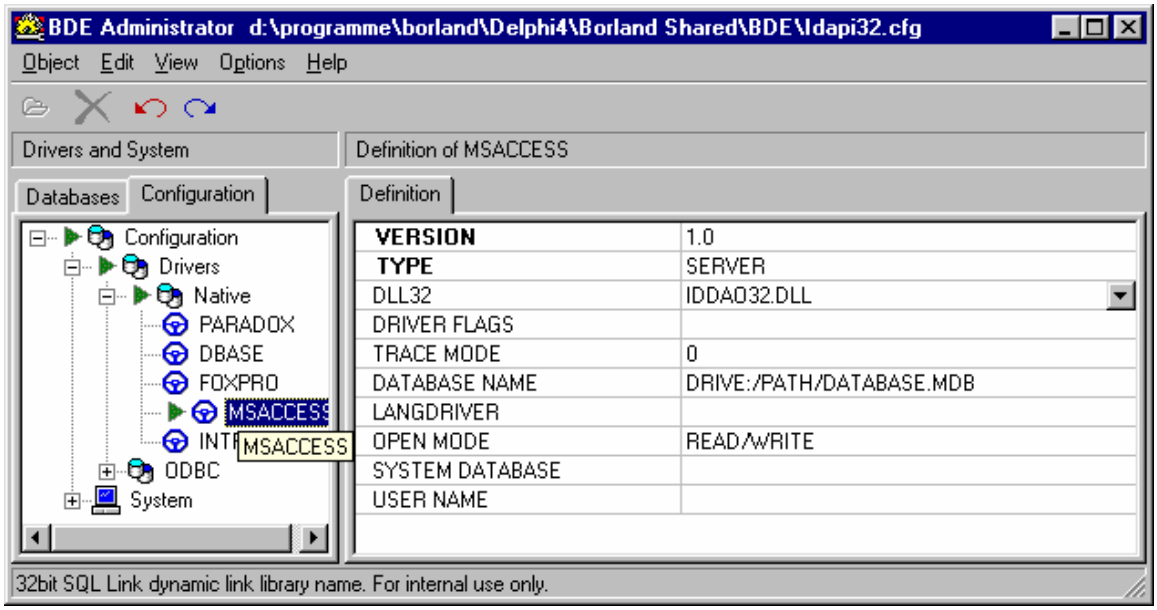
When the installation is performed, the Borland Database Engine (BDE) is also set up.
In directory C:\Programs\Borland\Common Files\Bde, start the program **BDEADMIN.EXE.** This is the Borland database manager. This sets up the database references (the aliases).
Here is an illustration of the user interface:-



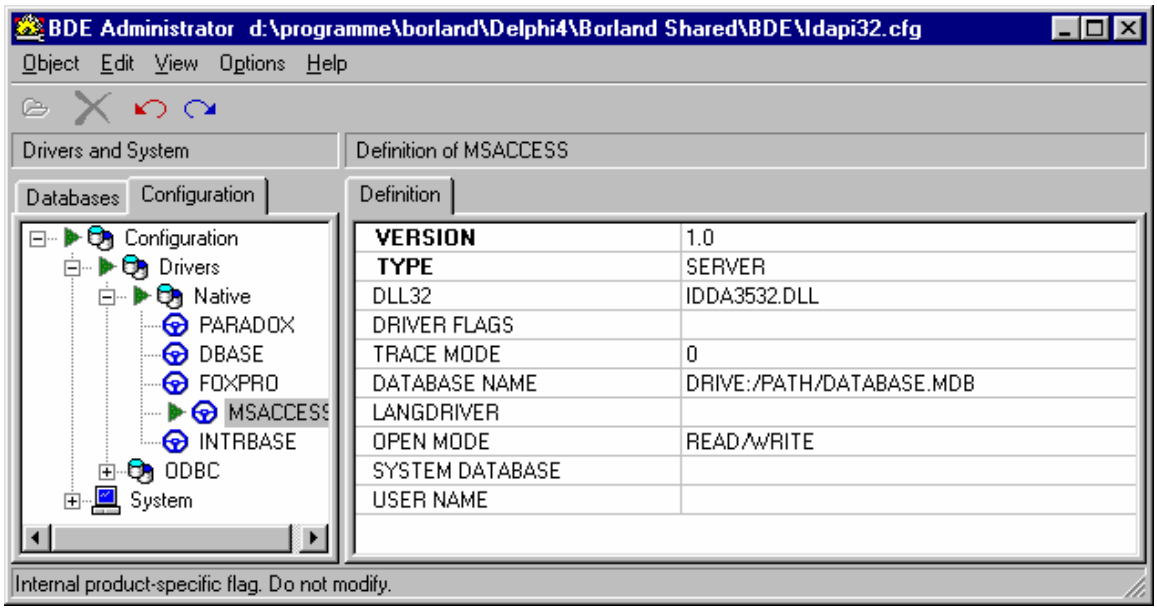
The entries on the left-hand side may differ from those shown above. Of importance here is only the LON230 entry which creates the database connection to the Access database.
In the subsequent right-hand window, click the line with the entry DATABASE NAME. Using the browser's button, select the database file LON230.MDB in the C:\programs\Lon230 path.
Use the 'Object→Apply' menu item to adopt and activate the change.



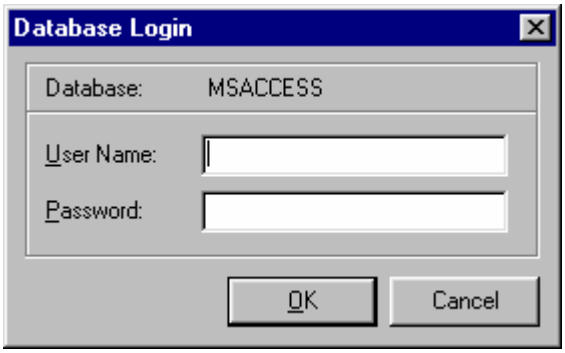
Here is an illustration of the updated window:-
Another job that has to be done is to change the database version from 3.0 to 3.5 (Microsoft DAO).
To do this, select the 'Configuration' tab in the left-hand window and open up the tree to 'Configuration→Drivers→Native→MSACCESS' as shown here.



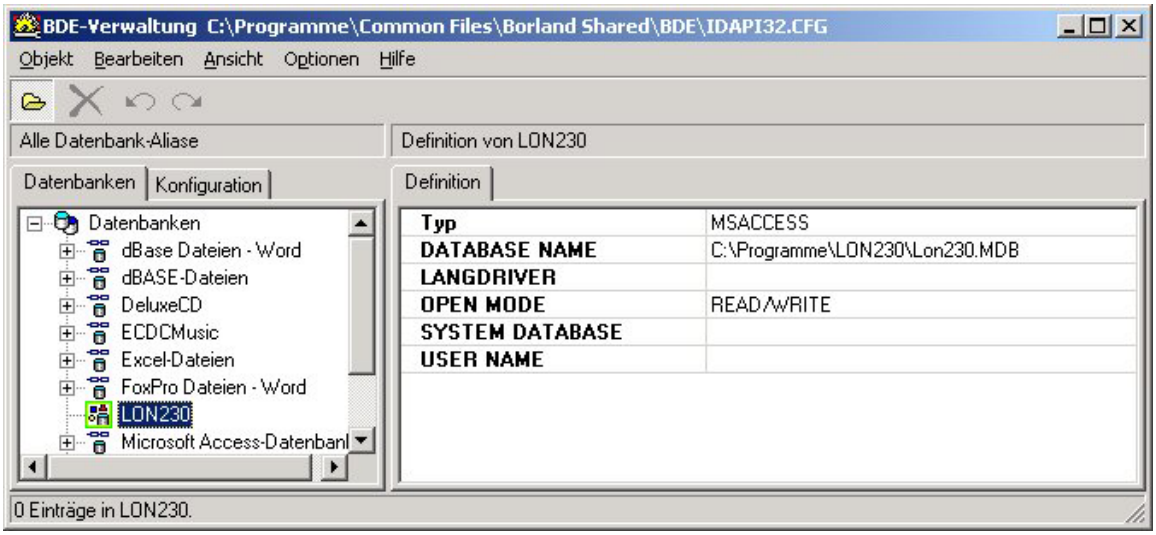
In the right-hand window, change entry DLL32 from Version 3.0 (IDDAO32.DLL) to Version 3.5 (IDDA3532.DLL; click line and use arrow to choose).



Again, you must accept the changes with menu item 'Object' → 'Apply'. To confirm, close BDE Administrator and re-start (double-click BDEADMIN.EXE).
Now, to check whether the database can be made to respond, select the 'Databases' tab in the left-hand window again and click on the plus symbol in front of the LON230 alias entry. A log-on window will appear when this is done.
Press OK to confirm this window, with a blank user name and a blank password.



If no error message appears and the field designations in the right-hand window are shown in **bold**, the database has opened correctly.



Now you can close the database manager again.

3 Project engineering

3.1 LON data points (SNVTs)

In principle, it is possible to process all data points of the integer type, floating point values, enumerations (enums) and simple structures.
More complex structures and character strings, etc. are not possible at the moment, or there is no point to them.
The Annexe gives a complete list of all the possible data points (SNVTs).

3.2 Integration of the LON data points into the EY3600 system

The nova230 exchanges information with the LON devices via the MFA 254-64.
In the CASE FBD schematic, access to the data is possible via hardware I/O addresses.
The card code is used to set the way the data are to be interpreted.

Data type	Example	Hardware card code	FW module
Alarm/signal	from nvoDewPt	10 alarm/status	BI (fC8)
Switch output	to nviFanSpeed	20 command	DO
Switch output with BRM	to nviFanSpeed	30 command with BRM	DO
Analogue input	from nvoSpaceTemp	70 measurement	AI
Analogue output	to nviHeatOutput	80 setpoint	AO
Analogue output with ARM	to nviHeatOutput	A0 setpoint with ARM	AO
Counter input	from SNVT_elec_kwh	D0 counter	CI

Note:
On the LON bus, switch signals are transmitted as analogue signals.
A value range is assigned to each switching stage.
The assignment may look like this, for example:

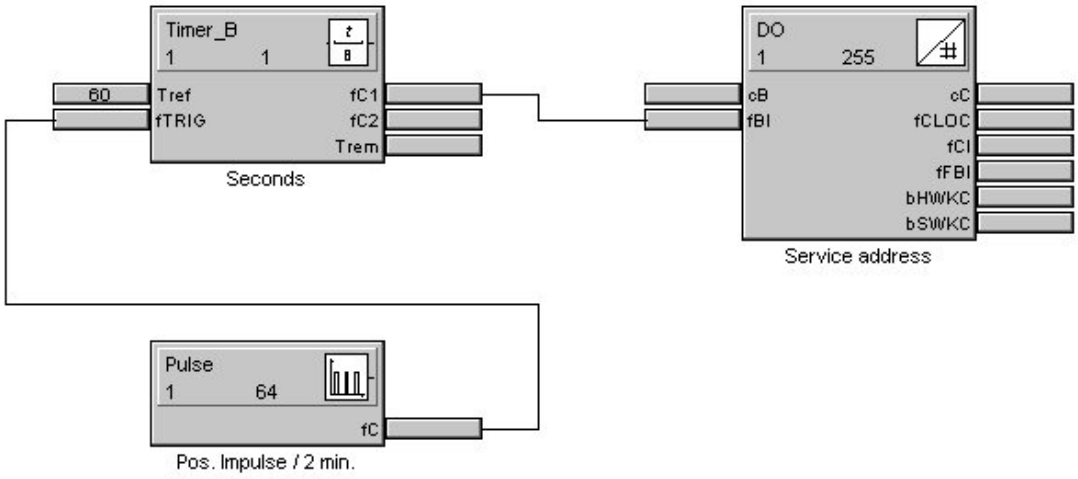
Range	Stage
0%...49.5%	0
50%...100%	I

When the data point list is being generated, you can adjust the value range using MinValue and MaxValue.

3.3 Cyclical commands to LON bus

As from the microprogram with index K, it is possible to send cyclical commands to the LON bus via the fixed MFA255.
The MFA255 is generated as a **DO** with hardware card code 30 (binary command with FB). This enables you, via a pulse/timer_B structure, to put a cyclical command at the input of this MFA, thereby trigger the 'new' flag of the address.
This, in turn, bewirkt that all the commands and analogue setpoints (card codes 20, 30, 80 and A0) defined in the LON generating list are sent to the LON bus with every timer overflow. Therefore, a cyclical refresh of all setpoints and commands is possible.

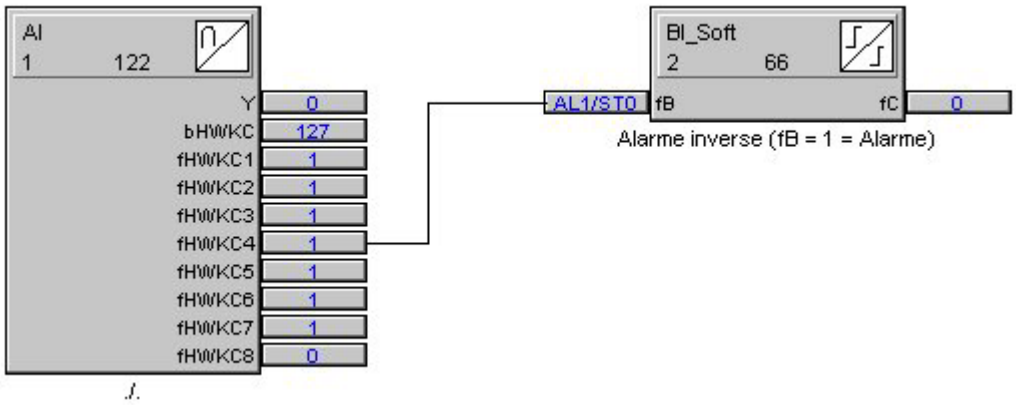
Below is an example with a cyclical refresh of all setpoints and commands in cycles of one minute.
The timer and pulse values should be matched to the relevant refresh rate:-



3.4 Fault-monitoring of SNVTs

As from the microprogram with index K, it is possible to tell, via the hardware card code, whether a SNVT has been transmitted correctly, or whether a bus interruption, node defect etc. has occurred.
If a fault is reported in the event of an NV fetch, then the MFA's hardware card code is set from, for instance, 10 (message) to 1F. This setting of Bit 0..3 can be detected via outputs of the input/output modules and can be processed via BI_Soft modules as a fault message.
A collective alarm is reported on feedback fFBI of MFA255 whenever at least one SNVT fault message occurs.

Below is an example:-
Example: a measured value with **AI** module.
The hardware card code is 70 hex. when the SNVT answers.
The hardware card code is 7F hex. (7F hex or 127 dec. in the display) when the SNVT no longer answers.



4 Putting LON nodes into operation

See Chapter **1.2** Putting into service

4.1 Preparation of LON gateway IFM-RS232

1. Connect the LON gateway IFM-RS232 to the COM1 interface of a PC using a 9-pin cable, with 1-to-1 wiring (9-pin extension) .
2. Start the terminal program (Hyperterminal, Norton etc.) on the PC (settings: 4800 baud, 8 data bits, 1 stop bit, no parity, no handshake).
3. On the IFM-RS232, keep the black button pressed in and then switch on the IFM-RS232. (yellow LED lights up and goes out when the operator lets go of the black button).
4. In the terminal window, you will see a menu that allows you to change the current parameters. A time-out of 10 sec. puts the IFM232 back to normal mode. In this case, repeat at Item 3.
5. Set the baud rate to 9600 Bd, and the sleep mode to OFF. Confirm these settings with 'Yes'.
6. Disconnect the IFM from the voltage and switch on again (reset). Wait until the red LED has stopped flashing.
7. The interface is now ready for operation on the PC.
   Note: A detailed description of the interface is given in document IFM-RS232 from *Sysmik* (see the Annexe for the download address).

8 Close Hyperterminal.

4.2 Preparing LON node using ALTO

9. Start Alto:
   Set Alto:

10. Setting/interface	COM Baud: 9600 Baud
Setting	Online
11. Engineering/Module assignment	Press ‘Read’ or briefly press the ‘Service’ button on the LON node: the Neuron ID appears
Choose node	Press ‘Advanced’
Status of module	Online
Length of domain ID	1
Domain ID	0...255
Subnet ID	1...255
Node ID	1...127

Note:
The Domain ID of all LON nodes that are connected to the same LON bus must be the same as the Domain ID of both the associated IFM232 and the LON230.
The IFM232 is also a LON node and should also be parameterised.

The red LED of the IFM232 lights up if communication is OK.
All nodes have to report **either** by enquiring using the 'Read' button **or** by the 'Service' button on the LON node.

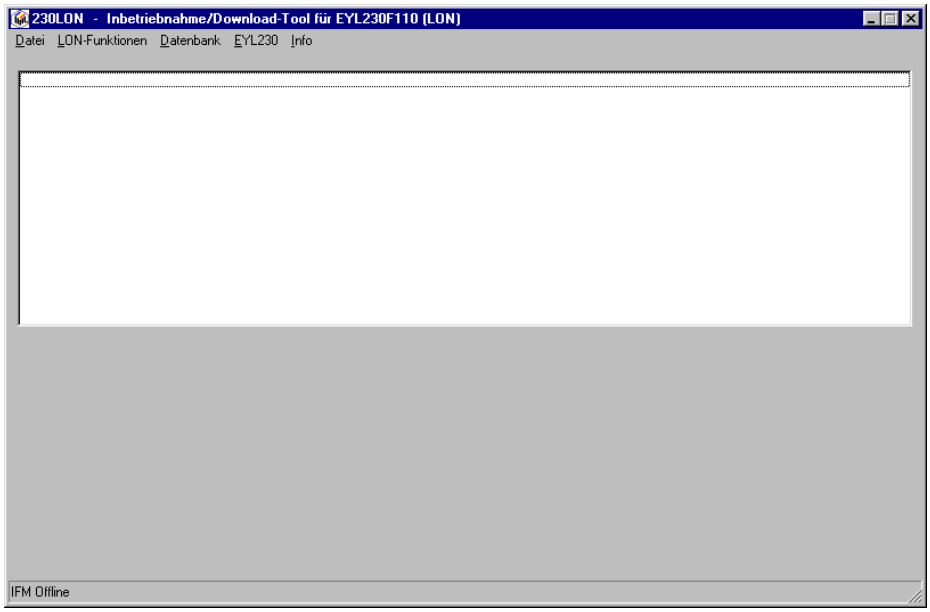
12. Close Alto.

4.3 Commissioning with LON230

Start→Run→C:\Programs\Lon230***LON230.EXE LON230.UK**.
The parameter LON230.UK after the program name indicates the language file (English). If there is no parameter, the English texts will be outputted (the file LON230.UK is the default).
It is a good idea to indicate this parameter in the form of a link.
To run the program in German, use the parameter LON230.GER.

After starting, the currently configured interface (COM1 etc.) is searched for an IFM-RS232 interface for about 10 seconds.
If no interface is found, an error message will appear after a waiting time of about 10 s and the status bar will show the message '**IFM Offline**'. Is an IFM-RS232 is found, you will see '**IFM Online**'.

The main window is shown as follows:-

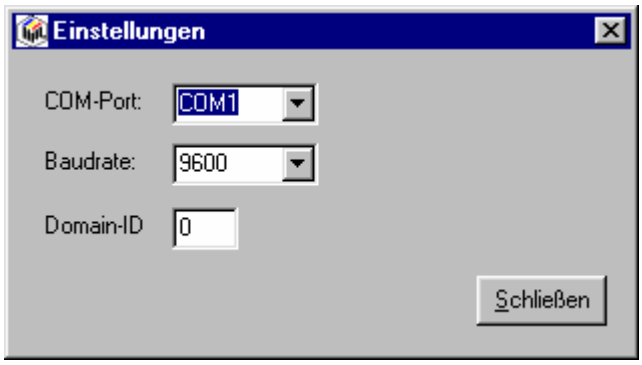


If the interface is to be connected to another COM port, select the relevant port from the File→Settings→COM-Port menu and restart the program.

File→Settings

You can set the COM port, the Domain ID and the baud rate for the IFM interface here. This is also where the domain ID for the LON network is assigned (0..255).

Note:
The Domain ID of the LON230 must be the same as the Domain ID of both the associated IFM232 and all the LON nodes that are connected to the same LON bus.



LON function→seek IFM

Search the COM port for an IFM interface.

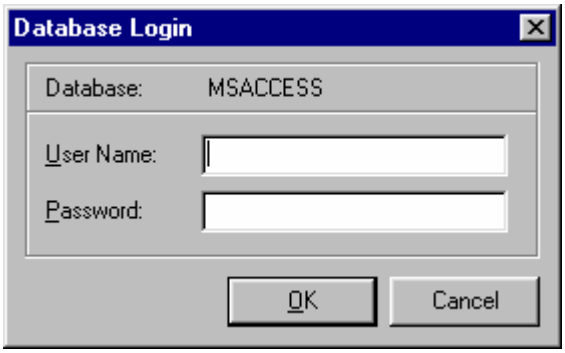
4.3.1 Scan the LON node

LON function→Scan network

Search the LON network for nodes. In the Listbox in the main window, all the nodes found with Subnet, Node, Prog-ID and Neuron ID are shown.

Database→Edit

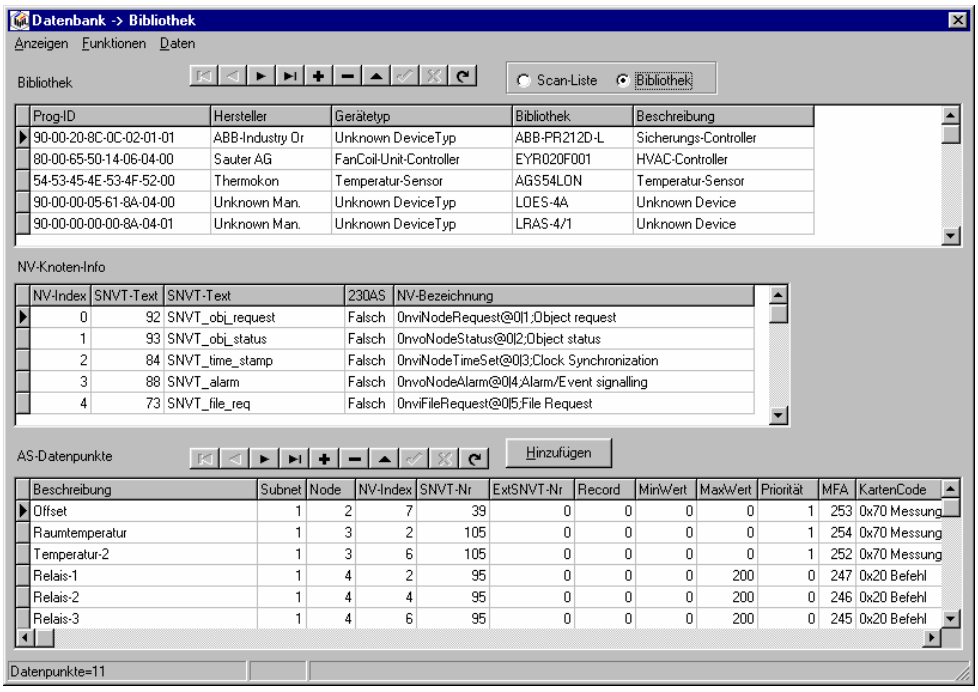
A login window appears.



Press ‘OK’ to confirm the window with no User Name and no Password.

Call up the database surface in a new form. This window is split into three and forms the selection tables for the data points and the generation of transfer lists.
Furthermore, there are options for importing data.

The database window is divided into three tables. This window allows you to select data points from the scan list and from the library. Afterwards, these selected data points form the generation list for the AS.
The database window is illustrated below:


Datenbank -> Bibliothek
Anzeigen Funktionen Daten
Bibliothek
Scan-Liste
Bibliothek
Prog-ID | Hersteller | Gerätetyp | Bibliothek | Beschreibung
90-00-20-8C-0C-02-01-01 | ABB-Industry Or | Unknown DeviceTyp | ABB-PR212D-L | Sicherungs-Controller
80-00-65-50-14-06-04-00 | Sauter AG | FanCoil-Unit-Controller | EYR020F001 | HVAC-Controller
54-53-45-4E-53-4F-52-00 | Thermokon | Temperatur-Sensor | AGS54LON | Temperatur-Sensor
90-00-00-05-61-8A-04-00 | Unknown Man. | Unknown DeviceTyp | LOES-4A | Unknown Device
90-00-00-00-00-8A-04-01 | Unknown Man. | Unknown DeviceTyp | LRAS-4/1 | Unknown Device
NV-Knoten-Info
NV-Index | SNVT-Text | SNVT-Text | 230AS | NV-Bezeichnung
0 | 92 | SNVT_obj_request | Falsch | 0nviNodeRequest@0|1;Object request
1 | 93 | SNVT_obj_status | Falsch | 0nvoNodeStatus@0|2;Object status
2 | 84 | SNVT_time_stamp | Falsch | 0nviNodeTimeSet@0|3;Clock Synchronization
3 | 88 | SNVT_alarm | Falsch | 0nvoNodeAlarm@0|4;Alarm/Event signalling
4 | 73 | SNVT_file_req | Falsch | 0nviFileRequest@0|5;File Request
AS-Datenpunkte
Hinzufügen
Beschreibung | Subnet | Node | NV-Index | SNVT-Nr | ExtSNVT-Nr | Record | MinWert | MaxWert | Priorität | MFA | KartenCode
Offset | 1 | 2 | 7 | 39 | 0 | 0 | 0 | 0 | 1 | 253 | 0x70 Messung
Raumtemperatur | 1 | 3 | 2 | 105 | 0 | 0 | 0 | 0 | 1 | 254 | 0x70 Messung
Temperatur-2 | 1 | 3 | 6 | 105 | 0 | 0 | 0 | 0 | 1 | 252 | 0x70 Messung
Relais-1 | 1 | 4 | 2 | 95 | 0 | 0 | 0 | 200 | 0 | 247 | 0x20 Befehl
Relais-2 | 1 | 4 | 4 | 95 | 0 | 0 | 0 | 200 | 0 | 246 | 0x20 Befehl
Relais-3 | 1 | 4 | 6 | 95 | 0 | 0 | 0 | 200 | 0 | 245 | 0x20 Befehl
Datenpunkte=11

1. Table in the database window
The first table shows either the scan list (the list of nodes that were found) or the library with the nodes that are already known. To switch between views, use the selection buttons above the list. You can navigate within the data files in the table by using the browser bar. The column entries are described below:

Scan list is shown

Subnet:	Subnet-ID of the node
Node:	Node-ID of the node
Neuron-ID:	Neuron ID of the node (6 bytes long)
Prog-ID:	Program-ID of the node (manufacturer and device code)
Lib:	Yes = already present in the database, No = unknown node
Manufacturer:	Company name of the device manufacturer (if known)
Device type:	Type of device (sensor, HVAC controller etc.)
Description:	Optional text
Library:	Node designation within the library (table name)

Library list is shown

Prog-ID:	Program ID of the node (manufacturer and device code)
Manufacturer:	Company name of the device manufacturer (if known)
Device type:	Type of device (sensor, HVAC controller etc.)
Library:	Node designation within the library (table name)
Description:	Optional text

4.3.2 Scan LON variable

Functions → Read node info

Read the self-documentation strings for the node and enter the information in a library (ACCESS database).

2. Table in the database window
The second list shows the respective network variables for the node selected in the upper list.
Each column is described below.

NV-Index:	Index of network variables
SNVT-No:	Standardised index of the respective SNVT variable.
SNVT-Text:	Standardised designation of the respective SNVT variable
230AS:	True = variable can be used in 230 generation False = variable cannot be used (structure, character string, etc.)
NV-designation:	Self-documentation string for this NV of the node.

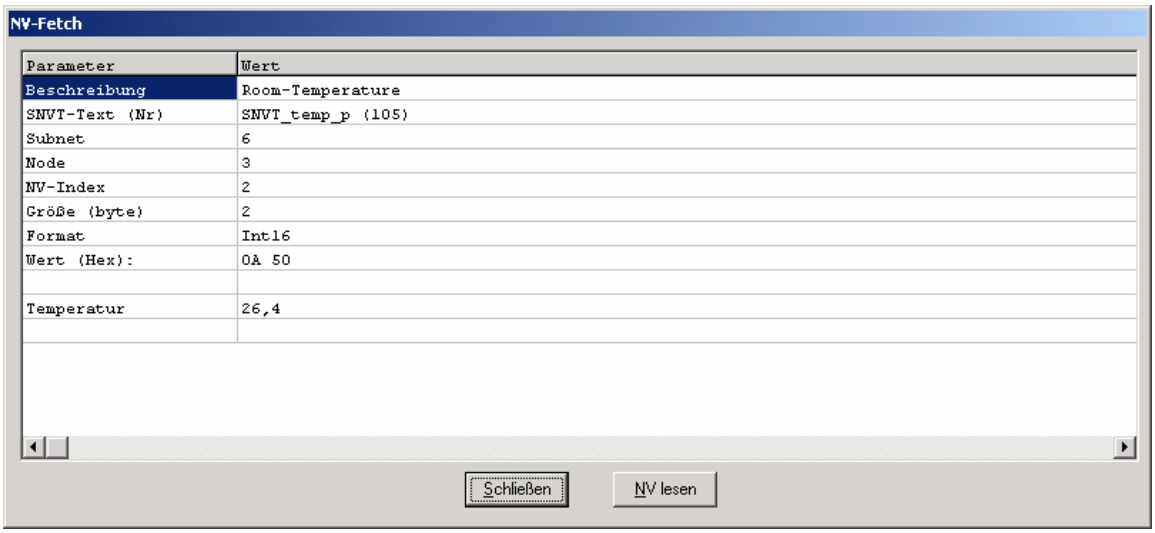
4.3.3 Read and write LON variable

View and change values

The various values of a node (SNVT variables) can be interrogated in either Table 2 (SNVT list of the node) or Table 3 (230AS generation). This function is called up using the right-hand mouse button from within the tables. A pop-up window then appears, providing two choices:-

- NV fetch (read data)
- NV update (write data)

NV fetch



The ‘Read NV’ button can be used to refresh the value (to interrogate again).
The values are shown in the lower part of the list in decoded plaintext format. The raw data are shown in the ‘Value (Hex):’ line. The upper lines describe the various parameters of the SNVT.

NV update
In this window, new values can be sent to nvi variables (input) (setpoint, commands).

The value to be sent should be entered in the relevant format (e.g. 26.5 for 26.5°C) in the ‘New value’ field.
The ‘Write NV’ button adds the value to the LON node.
If this has been carried out successfully, a message to this effect appears.

4.3.4 Edit transfer list

3. Table for the database window
The third list shows the generation list for the EYL 230 F110. Use the navigation bar to scroll, add and delete within the data files.
Press the 'Add' button to insert the active data file from the middle table with its parameters (Subnet, Node, SNVT etc.) into the lower table.
The maximum extent of an address is 191 data points. The first usable one is MFA254, and the last usable one is MFA 64.
The individual columns are described below.

Subnet:	Subnet-ID of the node
Node:	Node-ID of the node
NV-Index:	Index of the network variables
SNVT-No.:	Standardised index of the respective SNVT variable.
ExtSNVT-No:	Extended SNVT number for non-standard NVs
Record:	Record number for sub-addressing an NV (pointer to structures)
MinValue:	Lower value for SNVT_switch types (corresponds to 0%)
MaxValue	Upper value for SNVT_switch types (corresponds to 100%)
Priority:	0 = frequent reading of important messages (alarms, status, etc.) 1 = average reading of less important values (measurements) 2 = infrequent reading of unimportant values (meters, etc.)
MFA:	MFA of the AS (64..254)
CardCode:	Hardware card code for this address. This value should be meaningfully related to the SNVT variable (i.e. a LON measurement should be linked with a card code 0x70.)

Other functions within the table:
The status bar shows the current number of data files.
Click on the headers of the lower table to sort by designation, subnet, node, NV index and MFA.

Import → Delete 230 generation

Delete the entries in the 230 generation (empty list as basis for new projects).

Complete the list using + and Add (3rd table).

Data → Export 230 text table

Exporting a 230 AS generation into a tabulated text file (for processing in *Excel*). This list can be subsequently read back in using the above-mentioned import function.

Data → Import 230 text table

Importing a 230 AS generation with tabulated values (from *Excel* example).

Import → AS text file

Importing data-point generation from an *Excel* text file (tabulated) and entering these values into the database.
The structure of the text file must adhere to certain rules. All fields should be separated by tabulations. The format and the column headings must be observed. An example is printed below.

```
// Import file for EYL230F110 LON (tabulated text file)
// Generating data from table 230
// Project: Test project
// N.B.: Do not delete the first five lines of this file.
Description Subnet  Node NVI Rec  SNVTnr  ExtSNVTnr  MinVal.  MaxVal.  Priority  MFA  KC
Temperature1  1       3   2    0    105      0          0        0         2      254 112
Temperature2  1       3   5    0    105      0          0        0         2      253 112
Message       1       4   1    0     95      0          0      200         0      252  16
Command       2       5   6    0     95      0          0      200         0      251  32
Setpoint      2      12   1    0     39      0          0        0         2      250 128
Alarm         1       8   3    0     95      0          0      200         0      249  16
```

The first four lines represent comments (// as a start sign).
The fifth line represents the column headings. (Observe syntax.)
Up to 191 data points can be generated; all others are ignored.
The card code in the last column should be entered in decimal form (e.g.: $0x10_{Hex}$ → $16_{Dez.}$)

Functions → Consistency check

Checks the AS generation for possible errors (inadmissible areas etc.)

Consistency check
This menu item checks the 230 generation list for inadmissible areas etc. If any faults are found, a message with a reference to the relevant field is issued. Any subsequent download is possible only with a correct data-point list.

Free MFAs
This shows a list with all the MFAs that are still spare.

4.3.5 Downloading the data

- Switch the EYL 230 F110 off
- Move the plug-in bridge (jumper) into the 'TEST' position
- Plug in the connecting cable (zero modem cable or same cable as for the connection of the EYZ291 to the PC) between the PC COM port and the EYL 230 F110 using the 9-pin plug (RS-232)
- Switch on the EYL 230 F110
- Use menu item 'EYL230→Download' to open the Download window
  (A consistency check is carried out first; no download is possible if there are any errors!)
- Press the Send button to load the data into the EYL 230 F110
- After about 2 minutes, the station will have been parameterised (the green LED will flash)
- Wait for the message ‘Data transmission successful’ to appear
- Switch off the EYL 230 F110
- Connect the RS-232 connector of the EYL 230 F110 to the IFM-RS232 gateway (RS-232 socket) using a 9-pin 1-to-1 connecting cable
- Move the plug-in bridge to the 'RUN' position
- Switch on the EYL 230 F110
- After about 20 seconds, communication with the IFM-RS232 will start.

Note: While the installation is in operation, the plug-in bridge must be in the **'RUN'** position!

5 Monitoring mode

For commissioning purposes, it is possible to create a monitoring circuit to a terminal program on terminal 126 of the AS.
The connecting cable should be made as follows, for connection between the PC and the AS.

Assignment

AS-side (terminal)		PC-side (DB9 plug)
		1
126 Δ	⇒	2 RXD
		3 TXD
		4
⊥	⇔	5 GND
		6
		7
		8
		9

Terminal settings

9600 baud
8 data bits
no parity
1 stop bit
no handshake

To activate monitoring mode, the test jumper must be unplugged from the 'RUN' position and plugged into the 'TEST' position about 5 s after the station is switched on.

Here is an illustration of a log from the terminal program:-

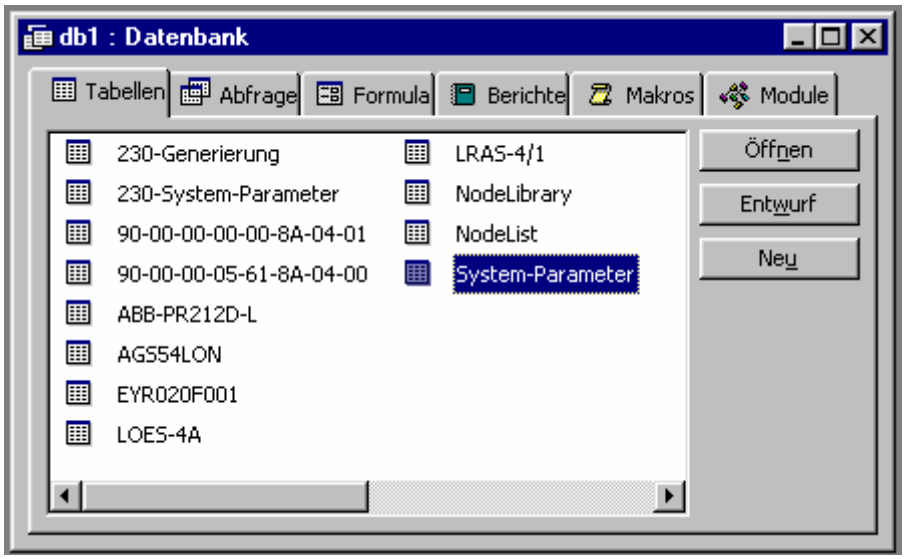
```
 nv_update o.k.IFM-Interface gefunden !
ClearBuffer o.k.
 Sollwert 111.00 von MFA 249 [0F 0A ]
 nv_fetch (  1/  4/  2) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/  3/  7) Wert= [0F 0A 00 ]   111.00
 nv_fetch (  1/ 10/ 16) Wert= [7F FF 00 ]   327.67
 nv_fetch (  1/ 20/ 14) Wert= [00 00 00 00 00 ]     0.00
 nv_fetch (  1/  4/  3) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/ 10/ 20) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/  4/  2) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/  3/  7) Wert= [0F 0A 00 ]   111.00
 Fehler bei nv_fetch (  0/  0/  0)
 nv_fetch (  1/  4/  3) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/ 10/ 20) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/  4/  2) Wert= [00 00 00 ]     0.00
 nv_fetch (  1/  3/  7) Wert= [0F 0A 00 ]   111.00
```

The nv_fetch messages that are shown (value enquiries) show the value in hexadecimal form, with the decoded version in decimal format.
The address is shown in brackets with (Subnet, Node, NV index).
Setpoint adjustments or commands are shown with an indication of the source MFA.

6 Annexe

6.1 Structure of the MS-ACCESS database

All data relating to the nodes, libraries, AS generations etc. are saved in an MS Access 97 database. The database can be edited with an Access 97 version. If you use an Access 2000 version, the database has to be converted into an Access 97 database first. When you have finished editing , it has to be exported into in Access 97 format again. An overview of the tables is shown below:-



Description of the individual tables

- 230 generation: data point generation for the AS
- 230 system parameters: communication parameters for the AS
- 90-00-00-00-00-8A-04-01: node data (SelfDocInfo) for a node with this Prog-ID (can be renamed)
- ABB-PR212-D/L ABB node of type PR212-D/L
- NodeLibrary: library with various nodes (includes Prog-ID, manufacturer, description, type, etc.)
- NodeList: scan list (contains the nodes that were last scanned)
- SystemParameters:
  - baud rate for IFM (4800 or 9600 allowed)
  - Com-Port for IFM
  - SearchIFM: disable IFM (offline mode)
  - Domain-ID: domain number which is searched.

Notes
No parameters in the database may be changed, deleted or added manually (using ACCESS) because this changes the structure of the tables, so that program LON230.EXE is unable to work with this database in certain circumstances.
For documentation purposes, however, these tables can be exported and printed, etc.

6.2 SNVT list

Overview of all SNVTs that can be used on the EYL 230 F110 (status: 07/01).

SNVT No.	SNVT type	Read with EYL230F110	Write with EYL230F110
0	Non-Standard-NV	No	No
1	SNVT_amp	Yes	Yes
2	SNVT_amp_mil	Yes	Yes
3	SNVT_angle	Yes	Yes
4	SNVT_angle_vel	Yes	Yes
5	SNVT_btu_kilo	Yes	Yes
6	SNVT_btu_mega	Yes	Yes
7	SNVT_char_ascii	Yes	Yes
8	SNVT_count	Yes	Yes
9	SNVT_count_inc	Yes	Yes
10	SNVT_date_cal	No	No
11	SNVT_date_day	Yes	Yes
12	SNVT_date_time	No	No
13	SNVT_elec_kwh	Yes	Yes
14	SNVT_elec_whr	Yes	Yes

SNVT No.	SNVT type	Read with EYL230F110	Write with EYL230F110
15	SNVT_flow	Yes	Yes
16	SNVT_flow_mil	Yes	Yes
17	SNVT_length	Yes	Yes
18	SNVT_length_kilo	Yes	Yes
19	SNVT_length_micr	Yes	Yes
20	SNVT_length_mil	Yes	Yes
21	SNVT_level_cont	Yes	Yes
22	SNVT_level_disc	Yes	Yes
23	SNVT_mass	Yes	Yes
24	SNVT_mass_kilo	Yes	Yes
25	SNVT_mass_mega	Yes	Yes
26	SNVT_mass_mil	Yes	Yes
27	SNVT_power	Yes	Yes
28	SNVT_power_kilo	Yes	Yes
29	SNVT_ppm	Yes	Yes
30	SNVT_press	Yes	Yes
31	SNVT_res	Yes	Yes
32	SNVT_res_kilo	Yes	Yes
33	SNVT_sound_db	Yes	Yes
34	SNVT_speed	Yes	Yes
35	SNVT_speed_mil	Yes	Yes
36	SNVT_str_asc	No	No
37	SNVT_str_int	No	No
38	SNVT_telcom	Yes	Yes
39	SNVT_temp	Yes	Yes
40	SNVT_time_passed	No	No
41	SNVT_vol	Yes	Yes
42	SNVT_vol_kilo	Yes	Yes
43	SNVT_vol_mil	Yes	Yes
44	SNVT_volt	Yes	Yes
45	SNVT_volt_dbmv	Yes	Yes
46	SNVT_volt_kilo	Yes	Yes
47	SNVT_volt_mil	Yes	Yes
48	SNVT_amp_f	Yes	Yes
49	SNVT_angle_f	Yes	Yes
50	SNVT_angle_vel_f	Yes	Yes
51	SNVT_count_f	Yes	Yes
52	SNVT_counts_inc_f	Yes	Yes
53	SNVT_flow_f	Yes	Yes
54	SNVT_length_f	Yes	Yes
55	SNVT_lev_cont_f	Yes	Yes
56	SNVT_mass_f	Yes	Yes
57	SNVT_power_f	Yes	Yes
58	SNVT_ppm_f	Yes	Yes
59	SNVT_press_f	Yes	Yes

SNVT No.	SNVT type	Read with EYL230F110	Write with EYL230F110
60	SNVT_res_f	Yes	Yes
61	SNVT_sound_db_f	Yes	Yes
62	SNVT_speed_f	Yes	Yes
63	SNVT_temp_f	Yes	Yes
64	SNVT_time_f	Yes	Yes
65	SNVT_vol_f	Yes	Yes
66	SNVT_volt_f	Yes	Yes
67	SNVT_btu_f	Yes	Yes
68	SNVT_elec_whr_f	Yes	Yes
69	SNVT_config_src	Yes	Yes
70	SNVT_color	No	No
71	SNVT_grammage	Yes	Yes
72	SNVT_grammage_f	Yes	Yes
73	SNVT_file_req	No	No
74	SNVT_file_status	No	No
75	SNVT_freq_f	Yes	Yes
76	SNVT_freq_hz	Yes	Yes
77	SNVT_freq_kilohz	Yes	Yes
78	SNVT_freq_milhz	Yes	Yes
79	SNVT_lux	Yes	Yes
80	SNVT_ISO_7811	No	No
81	SNVT_lev_percent	Yes	Yes
82	SNVT_multiplier	Yes	Yes
83	SNVT_state	Yes	No
84	SNVT_time_stamp	No	No
85	SNVT_zero_span	No	No
86	SNVT_magcard	No	No
87	SNVT_elapsed_time	No	No
88	SNVT_alarm	Yes	No
89	SNVT_currency	No	No
90	SNVT_file_pos	No	No
91	SNVT_muldiv	No	No
92	SNVT_obj_request	No	No
93	SNVT_obj_status	No	No
94	SNVT_preset	No	No
95	SNVT_switch	Yes	Yes
96	SNVT_trans_table	No	No
97	SNVT_override	Yes	Yes
98	SNVT_pwr_fact	Yes	Yes
99	SNVT_pwr_fact_f	Yes	Yes
100	SNVT_density	Yes	Yes
101	SNVT_density_f	Yes	Yes
102	SNVT_rpm	Yes	Yes
103	SNVT_hvac_emerg	Yes	Yes
104	SNVT_angle_deg	Yes	Yes

SNVT n°	Type de SNVT	Lire avec EYL230F110	Ecrire avec EYL230F110
105	SNVT_temp_p	Yes	Yes
106	SNVT_temp_setpt	No	No
107	SNVT_time_sec	Yes	Yes
108	SNVT_hvac_mode	Yes	Yes
109	SNVT_occupancy	Yes	Yes
110	SNVT_area	Yes	Yes
111	SNVT_hvac_overid	No	No
112	SNVT_hvac_status	Yes	No
113	SNVT_press_p	Yes	Yes
114	SNVT_address	Yes	Yes
115	SNVT_setting	No	No
116	SNVT_scene_cfg	No	No
117	SNVT_scene	No	No
118	SNVT_evap_state	Yes	Yes
119	SNVT_therm_mode	Yes	Yes
120	SNVT_defr_mode	Yes	Yes
121	SNVT_defr_term	Yes	Yes
122	SNVT_defr_state	Yes	Yes
123	SNVT_temp_min	Yes	Yes
124	SNVT_temp_hour	Yes	Yes
125	SNVT_ph	No	No
126	SNVT_ph_f	No	No
127	SNVT_chlr_status	No	No
128	SNVT_tod_event	No	No
129	SNVT_ctlr_resp	No	No
130	SNVT_fire_test	Yes	Yes
131	SNVT_temp_ror	No	No
132	SNVT_fire_init	Yes	Yes
133	SNVT_fire_indct	Yes	Yes
134	SNVT_time_zone	No	No
135	SNVT_earth_pos	No	No
136	SNVT_reg_val	No	No
137	SNVT_reg_val_ts	No	No
138	SNVT_volt_ac	No	No
139	SNVT_amp_ac	No	No
140	nicht definiert	No	No
141	nicht definiert	No	No
142	nicht definiert	No	No
143	SNVT_turbidity	Yes	Yes
144	SNVT_turbidity_f	Yes	Yes
145	SNVT_hvac_type	Yes	Yes
146	SNVT_elec_kwh_l	No	No
147	SNVT_temp_diff_p	Yes	Yes
148	SNVT_ctrl_req	No	No
149	nicht definiert	No	No

SNVT No.	SNVT type	Read with EYL230F110	Write with EYL230F110
150	SNVT_ptz	No	No
151	SNVT_privacy_zone	No	No
152	SNVT_pos_ctrl	No	No
153	SNVT_enthalpy	Yes	Yes
154	SNVT_gfci_status	Yes	Yes
155	SNVT_motor_state	Yes	Yes
156	SNVT_pumpset_mn	No	No
157	SNVT_ex_control	No	No
158	SNVT_pumpset_sn	No	No
159	SNVT_pump_sensor	No	No
160	SNVT_abs_humid	Yes	Yes
161	SNVT_flow_p	Yes	Yes
162	SNVT_dev_c_mode	Yes	Yes
163	SNVT_valve_mode	Yes	Yes
164	nicht definiert	No	No
165	SNVT_state_64	Yes	No

Special features of structured variables
Some structured variables which do not comprise a single value require some special settings during generation. These include the SNVTs listed below:-

1. **SNVT_state(83)**
   This variable stores 16 binary statuses. These separate bits can be placed onto one MFA of the EYL230F110 and accessed via a BI. In so doing, the SNVT is read only once by the LON bus, even if all 16 bits are used.
   The relevant bit should be stated via the 'Record' field in the 230 generation table. A value of 0...15 should be entered for this.

2. **SNVT_state_64(165)**
   See Item 1 (SNVT_state(83)), but with 64 bits. Same addressing.

3. **SNVT_switch(95)**
   This SNVT is a structure with a State field and a Value field. A status is added or switched in the State field; in the Value field, a binary or an analogue measured value is read or a setpoint/switching command is added.

   Read values from node:-
   Record field = 0: → Value-value is read by the node
   Record field = 1: → State field is read by the node

   Write values to node:-
   1. As a command with DO:-
      Command value = ‚1': → Value-value = value in the 'MaxVal' field
      → State field = 1
      Command value = ‚0': → Value-value = value in the 'MinVal' field
      → State field = 0

   2. As a setpoint with AO:-

Setpoint = Value	State	Action
0	0	AUS, 0%
1..200	1	ON, 0.5% .. 100%
201..254	1	ON, 100%
255	0	OFF, undefined 0%

4. **SNVT_alarm(88)**
   This SNVT is a structure with several fields which show various of the node's alarm statuses. It can only be read by this SNVT.
   The relevant information can be edited on the one hand in a binary, on the other as a measured value:-
   1. Binary, BI (Alarm, Status)
      The alarm_limit[] field of the SNVT is compared with a preset value and, if it matches, an alarm is set.

In the 230 generation in the 'Record' field, one of four alarm_limit bytes (0..3) should be selected. The comparison value (alarm code) should be set in the 'MinVal' field.

2. Analogue measured value, AI
A 1-byte access to the following bytes of the structure is possible: the reading parameter should be stated in the 'Record' field:-

SNVT parameter	Record entry (230 table)
alarm_type Byte8	0
priority_level Byte9	1
value[0] Byte12	2
value[1] Byte13	3
value[2] Byte14	4
value[3] Byte15	5
alarm_limit[0] Byte25	6
alarm_limit[1] Byte26	7
alarm_limit[2] Byte27	8
alarm_limit[3] Byte28	9

5. SNVT_hvac_status(112)
This SNVT is a structure with several fields which show various statuses of a HVAC node. It can only be read by this SNVT.

The relevant information can be edited only as a measured value (AI). The table below shows the access to the various fields. The addressing is done via the Record field:-

SNVT parameter	Record entry (230 table)
Mode 0..9	0
heat_output_primary	1
heat_output_secondary	2
cool_output	3
econ_output	4
fan_output	5
in_alarm 0/1	6

6. All ENUM values (enumeration variables, 1 byte long)

Read from these SNVTs:-

Target MFA	LON value	MFA value
BI	0	0
	> 0	1
AI	0 .. 255	0 .. 255

Write to these SNVTs:-

Target MFA	LON value	MFA value
DO	0,1,2,3,4,5,6	0,1,2,3,4,5,6
	> 6	undefined, not allowed
AO	0 .. 255	0 .. 255

6.3 Connecting cables

6.3.1 nova230 <-> IFM232 and IFM232 <-> PC

Serial cable, DB9 plug to DB9 socket, 1:1 wiring.

AS-side (DB9 socket)		Gateway-side (DB9 plug)
2 RXD	⇐	2 TXD
3 TXD	⇒	3 RXD
5 GND	⇔	5 GND

The communication parameters are set in the factory.

Serial cable, DB9 plug to DB9 socket, 1:1 wiring, assignment: see above.

Terminal settings:

4800 baud
8 data bits
no parity
1 stop bit
no handshake

6.3.2 nova230 <-> PC (configuration)

Serial cable, DB9 socket to DB9 socket, crossed wires or rs-PARA cable.

Assignment:

AS-side (DB9 socket)		PC-side COM1 port (DB9 socket)
2 RXD	⇐	3 TXD
3 TXD	⇒	2 RXD
5 GND	⇔	5 GND

AS-side Service interface (DIN plug, 5-pin, 180°)		PC-side COM1 port (DB9 socket)
2 GND	⇔	5 GND
5 TXD	⇒	2 RXD
3 RXD	⇐	3 TXD

The communication parameters are set in the factory.

6.3.3 nova230 <-> PC (monitor)

Assignment

AS-side (terminal)		PC-side (DB9 socket)
		1
126 Δ	⇒	2 RXD
		3 TXD
		4
⊥	⇔	5 GND
		6
		7
		8
		9

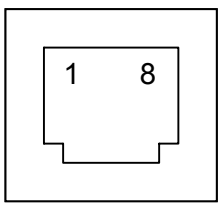
Terminal settings

9600 baud
8 data bits
no parity
1 stop bit
no handshake

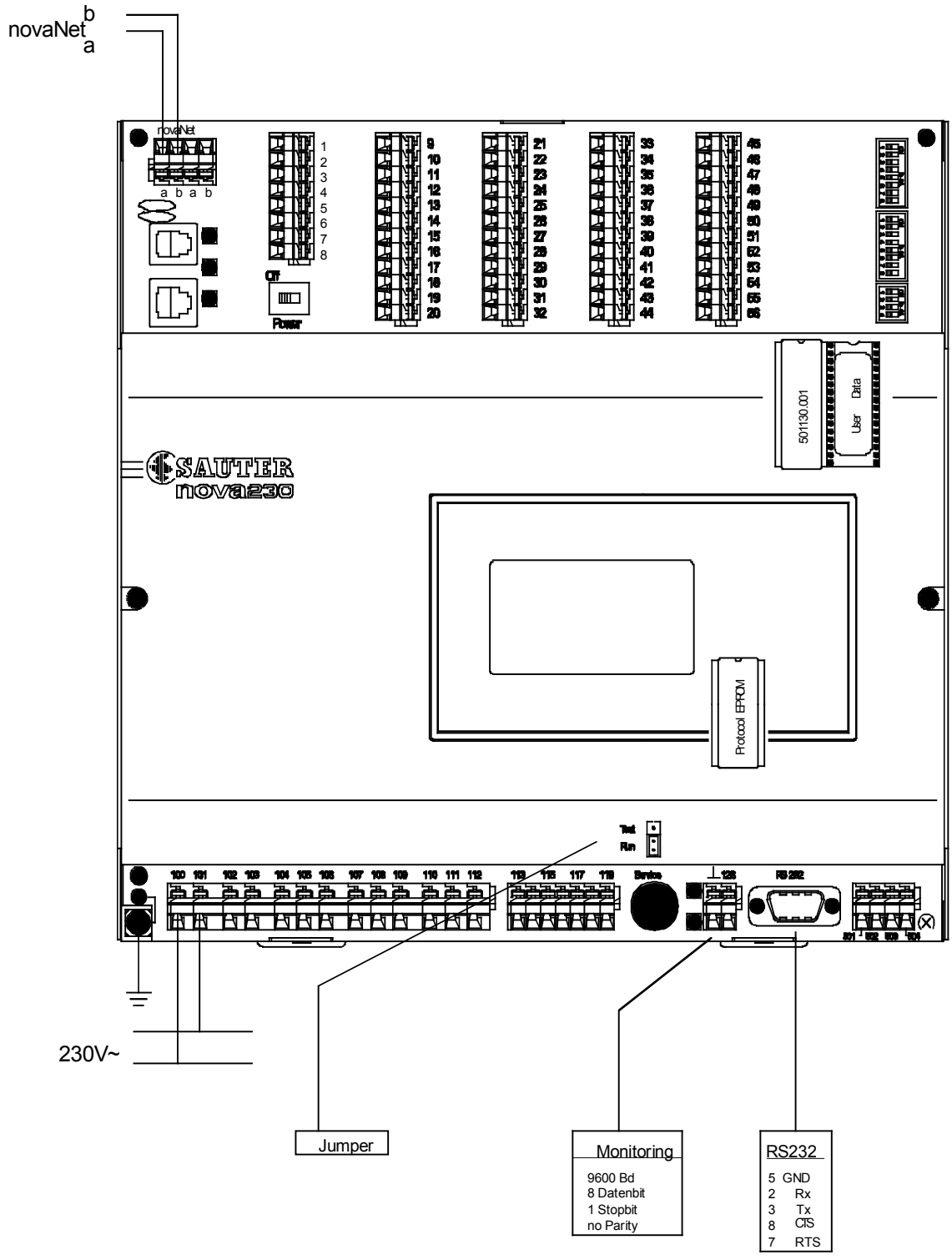
6.3.4 IFM232 <-> LON node

IFM232-side (RJ45 pin)		LON-node side (terminal plug)
1	⇔	A
2	⇔	B
3		
4		
5		
6		
7		
8		

RJ45 socket viewed from exterior



6.4 Connection diagram



6.5 Bibliography and links

WWW.SYSMIK.DE

- Download the ALTO LON parameterisation program
- Comments on proper planning of the topology for LONWORS® networks, network scheduling, cable selection, etc.
- Information on the IFM-RS232 LON interface module

WWW.LONMARK.ORG

- News and application information concerning LON
- Technical information at WWW.LONMARK.ORG/PRODUCTS/TECHCOR.HTM
- Guidelines (general requirements for LON nodes): http://www.lonmark.org/products/guides.htm -> lyr733.pdf
- Functional profiles: http://www.lonmark.org/products/fprofile.htm -> 11001_10.pdf
- SNVT / SCPT definitions: http://www.lonmark.org/products/snvtfile.htm -> LmRF1100.zip